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This document contains four papers. "Some Effects of Social Class and Race on Children's Language and Intellectual Abilities" by Martin Whiteman, Bert R. Brown, and Martin Deutsch is a report of research investigating several different interactions between environmental factors, socioeconomic status, race, and the cognitive and verbal abilities of 292 first and fifth grade Negro and white children in New York City. "Racial Attitudes as a Factor in Teacher Education for the Deprived Child" by Philip I. Freedman summarizes three research experiments, one analyzing the reluctance of Caucasian student teachers to work in special service schools, and the other two evaluating varying conditions of contact with Negroes as a means of reducing racial fears and antagonisms and establishing a more receptive psychological set for teaching deprived Negro children. "Effects of Environmental Deprivation on Basic Psychological Processes: Some Hypotheses" by Cynthia P. Deutsch combines a series of research findings to develop hypotheses regarding the relationships between auditory and visual discrimination and attentional, perceptual, and linguistic processes. "Indians in Two Public School Systems: Deprivation and Disadvantage" by Vernon F. Haubrich examined school achievement records, dropout statistics, and other data gathered on two Indian tribes in the Pacific Northwest to analyze relationships between home conditions, school program, and teacher observations and expectations. (JS)

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STUDIES IN DEPRIVATION

Some Effects of Social Class and Race on Children's Language and Intellectual Abilities

Martin Whiteman • Bert Brown • Martin Deutsch

Racial Attitudes as a Factor in Teacher Education for the Deprived Child

Philip I. Freedman

Effects of Environmental Deprivation on Basic Psychological Processes: Some Hypotheses

Cynthia Deutsch

Indians in Two Public School Systems: Deprivation and Disadvantage

Vernon Haubrich

Edited by Vernon Haubrich

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Studies in Deprivation attempts to examine aspects of depriving situations, attitudes of teachers towards their work with minority group children, and the growing body of evidence on the relation between deprivation, minority group status, and school success. The papers comprise studies of rural Indian poverty and aggregate data related to school performance; hypotheses regarding the nature and extent of auditory and environmental deprivation; teacher attitudes towards minority group children and the relationship of these attitudes towards tests of authoritarianism and rigidity; and finally, a review of social class, deprivation, race, and school achievement.

The hope of this publication is to better acquaint teachers, school administrators, and other interested personnel with the kinds of problems that face researchers in the field, as well as with the growing body of data detailing the extent of the problem and the direction which some studies may indicate. To become aware of the parameters of the issue, to delineate the character of the deprivation, and to examine the problem in its manifold dimensions is what the various authors have attempted to do.

The first of these papers is an exploration of the nature of social class and its relationship to the problems of race and schooling. Martin Deutsch delivered the paper and it has been subsequently expanded to include major additions by Professor Martin Whiteman of the New York School of Social Work and Professor Bert Brown of the Institute of Developmental Studies at New York Medical College. The careful and systematic manner in which the authors have looked at the question of race and social class to estimate the impact of each and both on children's language development and intellectual abilities is excellent in all respects.

The second of the papers concerns three significant experiments conducted by Dr. Philip Freedman on the question of racial attitudes and teacher prejudice. The timeliness and importance of such findings cannot be overestimated. Professor Freedman examined questions related to teacher education and to the potential for change in racial attitudes among prospective teachers. The significant findings of his paper constitute an area of concern which cannot be ignored by those who are concerned with the impact of race on teachers.

The third paper explores some hypotheses concerning environment. Cynthia Deutsch has been conducting experiments in this area at the New York Medical College's Institute for Developmental Studies for the last five years. The paper combines a series of findings by a wide range of researchers over the past years with some interesting and speculative hypotheses regarding the relationships between these findings and basic psychological processes of auditory discrimination, visual discrimination, and attentivity.

The fourth paper is an examination of school achievement records, dropout statistics, and other aggregate data gathered on two Indian tribes in the Pacific Northwest. Additionally, in descriptive form, the paper reviews the educational impact of depriving conditions on a group of four- and five-year-olds at a summer nursery program for Indian and non-Indian children. Teacher observations, site visits, and collection of observational data comparing the two groups constituted the basis for the differentials between the groups. The paper attempts to indicate the complex nature of the relationship that exists between home conditions, school program, and teacher observations and expectations. The single most important outcome was the lack of any simple, straightforward solution to the problem.

These four papers were given at a research symposium sponsored by the American Educational Research Association (February 1965), which was devoted to an exploration of deprivation and education. —*V. H.*

SOME EFFECTS OF SOCIAL CLASS AND RACE ON CHILDREN'S LANGUAGE AND INTELLECTUAL ABILITIES

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There is a frequently replicated finding that socio-economic status (SES) and racial group membership are important correlates of children's performance across a variety of measures of ability. Numerous investigations have demonstrated that, on the average, (a) lower SES children tend to perform less well than upper SES children; (b) Negroes perform less well than whites; and (c) within SES groups there is a tendency for white children to score at higher mean levels than Negro children (Eells *et al.*, 1951; Dreger and Miller, 1960; Klineberg, 1963). As Klineberg has noted, the outstanding, and as yet uncontrolled, factor in this research is the existence of considerable intraclass variance and intergroup overlap in the score distributions of measured abilities among these children. Perhaps the most prominent sources of this variability in performance are important differences in environmental conditions which may be experienced by children within the same SES levels or racial groupings.

For purposes of empirical study, SES levels, as well as racial groups, have traditionally been treated as homogeneous entities. This has permitted classification of subjects into groups for comparative analysis, but almost inevitably yields sizeable error variance. The assumption of relative homogeneity has been empirically useful; however, its latent function has been to limit investigators to demonstrating that differences in IQ or in other more specifically defined abilities exist between (a) children coming from lower-class as opposed to middle-class environments, or (b) Negro children as compared to white children.

It is of significance that while the replication of these normative differences has been highly consistent, investigators have largely failed to pursue the matter further, and have thereby neglected to pose an important question. This question is concerned with the identification of specific features of the lower-class environment which are associated with cognitive and verbal development. Beyond demonstrating that differences between groups exist, we must identify environmental factors which, when present or absent, can be related to performance on measures of these abilities.

It is also important to determine whether deficiencies in environmental stimulation, or more appropriately, environmental deprivations, have any greater effect on younger children as opposed to older children, in terms of their developing cognitive and verbal abilities. Presumably, the longer a child has experienced deprivation, the more pronounced should be its effects on the development of these abilities.

Related to this question is the problem of the kinds of abilities being studied. Though by no means definitive, there is a body of evidence suggesting that language measures are particularly responsive to the effects of social disadvantage (Bernstein, 1961; Milner, 1951). It would be important, therefore, to compare the environmental correlates of measures varying in the language component.

The purposes of the present study are–

1. To explore whether relations between specific environmental factors and performance on tests of cognitive and verbal abilities are independent of SES and race;

2. To investigate differences between younger and older children in cognitive and verbal abilities in an effort to determine whether the adverse effects of a socially deprived background became more pronounced with the passage of time;

3. To explore whether some specific environmental factors reflecting social disadvantage interact jointly with SES and race to affect children's performance on some cognitive and verbal tasks;

4. To investigate whether the deprivational aspects associated with lower socio-economic status, Negro status, or some specific environmental factors have greater effect upon more verbal as compared to less verbal tests.

Let us examine the concept of deprivation and its use here. Environmental factors can be viewed as socially depriving when at least two conditions are met: first, when they are predominantly found within certain social groupings such as those defined by SES or race; and, second, when they are associated with impaired performance, *e.g.*, lowered academic achievement.

Although an environmental condition may be associated with a particular psychological deficit, it would not be considered socially depriving if the con-

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An earlier version of this paper was read at the biennial meeting of the Society for Research in Child Development, Minneapolis, Minnesota, March, 1965.

dition were not socially patterned. Thus, a particular mode of child rearing may be associated with cognitive deficits, but we would not consider this as a social deprivation unless the mode of child rearing were more prevalent in one specific segment of the culture than in another. Nor would it be considered as a deprivation unless it also entailed a functional or behavioral deficit.

Social deprivation further implies that the association between social grouping and specific environmental factor is not strictly causal, *e.g.*, not genetically determined, but is mediated by more basic societal conditions, such as unemployment, poverty, and inequality of opportunity in various areas. With the removal of such conditions, the association between social grouping and the socially depriving factor may vanish. Social deprivation also implies that the association between environmental condition and performance decrement is causal, at least insofar as the deprivational factor hampers the learning of the performance in question. From this discussion, it can also be seen that "social deprivation" is a relative term. It is relative in two senses: first, a given environmental factor may be deprivational relative to one social group, *e.g.*, low SES, but not deprivational relative to another social group, *e.g.*, Negro; second, the environmental factor may be deprivational with respect to one ability or performance, but neutral or even advantageous with respect to other behaviors or functions.

From the above, it follows that the investigation of social deprivations involves both conceptual and empirical steps. The conceptual step implies the delineation of environmental conditions which on an a priori basis might qualify as social deprivations. In our study we have selected 15 of these conditions from a broader array of more than 30 background variables. These 15 factors include motivational variables: *e.g.*, parental schooling desires for child; factors related to the family: *e.g.*, presence of father in the home; and variables related to parental interaction, activities with adults, and school experiences.

The empirical step stems directly from our conception of social deprivation. Each of these 15 variables is studied from two vantage points: (a) whether it is related to an important psychological function such as reading, and (b) whether it is related to an important social grouping such as SES. The environmental conditions which meet these dual criteria might then be viewed as social deprivations. They comprise six variables which have been combined into a composite score, a **Deprivation Index.** The particular items and the mode of combination will be discussed below.

At this point, it would be well to summarize some of the functions which such an index can serve. The Deprivation Index can play the role of specifier, for it contains specific environmental features meeting criteria of social deprivation that we have set down above. It can play the role of mediator, for it can help account, at least partially, for the relation between SES and scores on ability tests. It can also play the role of independent contributor, for it serves as a set of environmental conditions which account for aspects of performance not accounted for by SES or race. Finally, it can serve as an interactive variable. Thus it may, in combination with other background factors, serve to account for performance over and beyond the contribution of the background variables taken singly.

Method

Sample

A sample of 292 first- and fifth-grade Negro and white children was obtained from 12 elementary schools located in three boroughs of New York City. The schools were selected to maximize the possibility of obtaining samples of Negro and white children with comparable SES distributions. The first- and fifth-grades were sampled to obtain approximately equal number of white and Negro subjects coming from both lower and middle SES backgrounds. The sample was also stratified by sex. Non-English speaking children were eliminated from this group. This is, of course, a cross-sectional study of first- and fifth-grade children, rather than a longitudinal study in which the same children would be followed from the first through fifth grade.

Indices

An objective estimate of socio-economic status (SES) was obtained for each S by ratings of the occupational prestige and educational attainment of the main support in each S's family.[1] This index was used to distinguish three SES levels within our sample: SES I: lower; SES II: lower middle; and SES III: middle.

The Deprivation Index was formed by obtaining a composite score for each S across six background variables. Each variable included in the Index was dichotomized to yield a score of one or two. The summed score was operationally defined as an Index of Deprivation. These variables, and the manner in which they were dichotomized, are identified in Table 1.

With the exception of housing information, data on each of these items were obtained either from parents or from S's themselves. An estimate of housing condition was made for the dwelling unit of each S by obtaining data from the U. S. Census of Housing, by block, for New York City.[2]

The correlations between each of the six environmental variables (given above) and fifth grade reading grade level score ranged between .20 and .32. All were relatively small correlations, but each exceeded chance expectation for a sample of this size ($N = 167$). The

Table 1

Description of Variables in Deprivation Index

Variable	Dichotomized
1. Housing Dilapidation index for block on which S resides, computed from census data	1 = Anything less than sound with complete plumbing (either dilapidated or deteriorating) 2 = Sound with complete plumbing
2. The educational aspirational level of the parent for the child	1 = College or less 2 = Graduate or professional training
3. The number of children under 18 in the home	1 = 3 or more 2 = 2 or less
4. Dinner conversation	1 = Did not engage in conversation because: Not allowed to Others participated but child did not No conversation, no indication why Ate alone 2 = Engaged in conversation
5. Total number of cultural experiences anticipated by child for coming weekend – visiting relatives, family, museums, library, zoo, travel outside NYC, school or lesson work.	1 = None 2 = One or more experiences (1-4)
6. Attendance of child in kindergarten	1 = No attendance at kindergarten 2 = Attendance at kindergarten

multiple correlation between the six environmental variables and reading grade level scores was .49. In addition, the multiple correlation between these six variables and SES was .48. This overall correlation is significant ($p<.01$), but since it accounts for not more than 25 per cent of the total variance within the sample on these variables, we may conclude that it is not sufficiently redundant with the SES measure to render it useless.

Each of the six variables may be viewed as an indicator of a specific type of socio-cultural deprivation which may occur in variable degree within any SES level, although we would generally suppose high deprivation to be more severe and more frequent within lower as opposed to middle or upper SES groups.

A more "deprived" score on the Index was obtained by those children with a cumulation of the following conditions, each of which is significantly associated with lower SES and with lowered reading achievement at the fifth grade level. 1. The families are larger, more crowded, and located in the more dilapidated neighborhoods. 2. The parents have lower educational aspirations for the children. 3. The children tend to have missed kindergarten. 4. The children report relatively limited conversation at dinner and limited cultural activities (as defined in Table 1) with parents or relatives.

The decision to use a composite index reflects the belief that cumulations of these variables are more significant (and more reliable) than each variable taken singly. The multiple correlations reported above attest to the enhanced effect of the joint action of these variables. However, the use of the children's expectations in the derivation of the cultural activities, and the use of the parents' judgments in appraising parental aspiration for the educational achievement of the child pose some methodological problems.

Thus, an increase in the expected number of cultural activities might be attributable to the child's verbal responsiveness in the test situation rather than to environmental realities. Militating against this interpretation, however, is the lack of significant correlation between cultural activities and independent measures of the child's total verbal output and verbal fluency in the test situation. Also, the sheer number of activities with parents as contrasted with the number of cultural activities does not correlate with reading achievement, contrary to the verbal fluency hypothesis. The parental educational aspiration might be considered spurious in so far as it is reflective of the child's reading level rather than contributive to it as an antecedent or concurrent environmental influence. However, a check upon this interpretation fails to support it. The correlation between the parents' educational aspiration and the parents' estimate of the child's reading ability at the fifth grade is not significant ($r = .11$). This finding suggests that there was little influence of perceived reading performance of the child on parents' educational aspiration.

Our dependent variables are two: (a) a non-language test of general intellectual ability, the Lorge-Thorndike Intelligence Test, and (b) a standardized test of vocabulary strength, the vocabulary subtest of Wechsler's Intelligence Scale for Children. Since our sample consisted of two different age groups, first- and fifth-graders, different forms of the Lorge-Thorndike test appropriate for each age level were used. Both forms, as reported by the authors, are designed to measure non-verbal aspects of intelligence. The first grade battery uses pictorial items only to measure abstract thinking, pictorial classification, and picture-pairing abilities. The items found in the fifth grade battery

typically involve picture classification, pictorial analogies, and items requiring distinctions between numerical relationships. Both forms are designed to be group administered.

Statistical Treatment

Analysis of variance was used to determine the extent to which systematic variation in performance on the two tests occurs as a function of SES, race, age, and Deprivation Index. Since the cell N's within this analysis are unequal, and in some cases disproportionate, analyses of variance using harmonic mean approximations were carried out on the data. For a full discussion of this procedure, the reader is referred to Winer (1962).

Since simultaneous classification by S's by four independent variables would have resulted in cell N's of zero, we have done three analyses in which SES, race, and Deprivation Index were varied, two at a time, together with grade level which was used in each analysis.

Results and Discussion

Analysis of Lorge-Thorndike test (non-verbal form).

Table 2 reveals that there were no significant differences between the two age groups on IQ scores. This was to be expected since the IQ, by definition, is adjusted for age. There were, however, significant differences between SES groups and between Negro and white S's; and a significant interaction between grade and race.

Table 2

Results of Three-Way Analysis of Variance on Lorge-Thorndike IQ Scores by Grade, SES, and Race (N = 292)

Source	*df*	*MS*	*f*	*p*
Grade (A)	1	< 1.000	0.00	ns
SES (B)	2	4362.31	21.61	<.01
Race (C)	1	4856.56	24.06	<.01
A × B	2	3.24	< 1.00	ns
A × C	1	883.32	4.38	<.05
B × C	2	299.88	1.48	ns
A × B × C	2	130.77	< 1.00	ns
Error	280	201.82		
Total	291			

These differences were in the expected directions with the means for lower SES S's being smaller than the means for the higher SES groups. In addition to the significant differences between SES groups, the Negro S's scored significantly lower than did the white S's.

Table 3

Means for SES Groups and for Race Groups on Lorge-Thorndike IQ Scores

Group	*Mean*	*SD*	*N*
SES I	94.31	14.89	110
SES II	102.67	14.83	99
SES III	109.16	14.69	83
Negro	97.01	14.30	152
White	106.08	16.36	140

Table 4 reveals that the significant interaction between grade and race was attributable to the stronger Negro-white differences at the fifth-grade level than at the first-grade level. Whereas the Negro children averaged five IQ points less than the white children at the first-grade level, this difference increased to 12 points at the fifth-grade level. (The difference between Negro and white S's reached statistical significance at the fifth grade level but not at the first-grade level, as determined by a test of simple effects).[3]

Table 4

Means on Lorge-Thorndike IQ Scores for Negro as Compared to White S's within Each Grade Level

Group	*Mean*	*SD*	*N*
Grade 1			
Negro S's	99.01	13.87	68
White S's	103.86	14.72	59
Grade 5			
Negro S's	95.39	14.52	84
White S's	107.70	17.37	81

Table 5 reveals that there were significant differences between S's coming from more, as opposed to less, deprived background conditions. Lower SES ratings and scores denoting greater disadvantage on the Deprivation Index were independently associated with IQ scores. In addition, this table indicates that there was a significant interaction effect of grade by deprivation on IQ scores.

Table 5

Results of Three-Way Analysis of Variance on Lorge-Thorndike IQ Scores by Grade, SES, and Deprivation

Source	*df*	*MS*	*f*	*p*
Grade (A)	1	0.00	0.00	ns
SES (B)	2	2120.95	10.06	<.01
Deprivation (C)	1	2191.07	10.40	<.01
A × B	2	45.68	< 1.00	ns
A × C	1	1492.79	7.08	<.01
B × C	2	.44	0.00	ns
A × B × C	2	29.15	< 1.00	ns
Error	277	210.77		
Total	291			

Table 6 reveals that regardless of grade, S's coming from the more deprived conditions obtained significantly lower IQ scores than did S's coming from the less deprived background conditions. Also, the effects of deprivation on IQ scores were more pronounced among older S's (fifth graders) than among the younger S's (first graders).

Table 6

Means for Overall Deprivation Levels and For Deprivation Levels within Grade on Lorge-Thorndike IQ Scores

Group	*Mean*	*SD*	*N*
More Deprivation	97.34	15.08	175
Less Deprivation	107.79	15.30	114
Grade 1			
More Deprivation	100.13	15.01	91
Less Deprivation	104.14	12.54	36
Grade 5			
More Deprivation	94.31	14.64	84
Less Deprivation	109.47	16.21	78

The interesting findings which emerge from Table 7 are (a) the vanishing of the significant interaction between grade and race noted in Table 2, and (b) the maintenance of the significant grade by Deprivation Index interaction reported in Table 5. It appears that once disadvantage, as assessed by the Deprivation Index, is controlled, the age decrement, as assessed by the Lorge-Thorndike test, among the Negro children tends to be ameliorated. However, the converse is not true within racial groups. The age decrement associated with the Deprivation Index is still significant.

Table 7

Results of Three-Way Analysis of Variance on Lorge-Thorndike IQ Scores by Grade, Race, and Deprivation

Source	*df*	*MS*	*f*	*p*
Grade (A)	1	43.07	<1.00	ns
Race (B)	1	3131.15	14.71	<.01
Deprivation (C)	1	4534.89	21.30	<.01
A × B	1	183.24	<1.00	ns
A × C	1	1068.79	5.02	<.05
B × C	1	159.12	<1.00	ns
A × B × C	1	38.29	<1.00	ns
Error	284	212.86		
Total	291			

Analysis of the Wechsler Vocabulary Subtest

Table 8 reveals that there were highly significant differences between the grades, between SES groups, and between Negro and white S's. In addition, there were significant interaction effects of grade by SES, and grade by race. The SES and race differences parallel those found on the Lorge-Thorndike test. However, in the case of the Lorge-Thorndike results, there was only a significant grade by race interaction, but not a significant grade by SES interaction.

Table 8

Results of Three-Way Analysis of Variance on WISC Vocabulary Subtest Score by Grade, SES, and Race (N = 289)

Source	*df*	*MS*	*f*	*p*
Grade (A)	1	24112.06	435.29	.0001
SES (B)	2	1044.82	18.86	.01
Race (C)	1	52.88	9.40	.01
A × B	2	262.75	4.74	.05
A × C	1	463.93	8.38	.01
B × C	2	24.11	1.00	ns
A × B × C	2	12.27	1.00	ns
Error	277	55.39		
Total	288			

One notes from examination of Table 8 that the difference between the two grade levels was a large one. Since the vocabulary subtest score is a raw score which contains no adjustment for age, it is not surprising that the differences in vocabulary, between six- and eleven-year-old children, are so large. The Negro children generally performed more poorly than did the white children, and the lower SES children performed more poorly than did higher SES children.

In Tables 9 and 10 the means for the significant effects are presented. These tables indicate that differences between Negro and white S's, as well as differences between lower and middle SES children, were in

Table 9

Means for Grade Levels, SES Groups, and Race Groups on WISC Vocabulary Subtest Scores

Group	*Mean*	*SD*	*N*
Grade 1	14.05	5.82	125
Grade 5	32.41	9.85	164
SES I	21.28	11.08	110
SES II	24.55	11.53	97
SES III	28.66	13.72	82
Negro	22.74	10.67	147
White	26.31	13.73	140

Table 10

Means for SES Groups and Race Groups within Grade Levels on WISC Vocabulary Subtest Scores

Group	*Mean*	*SD*	*N*
Grade 1			
SES I	12.17	5.40	46
SES II	14.72	5.81	43
SES III	15.64	5.84	36
Grade 5			
SES I	27.83	9.36	64
SES II	32.37	8.57	54
SES III	38.85	8.40	46
Grade 1			
Negro	13.97	6.19	68
White	14.14	5.49	57
Grade 5			
Negro	30.11	7.67	81
White	34.66	11.20	83

the expected direction and were sharper at the fifth-grade level than at the first-grade level. These differences, as tested by the simple effects method, reached statistical significance within the fifth grade, but not within the first grade.

Table 11 explores the possibility of interaction between SES and the Deprivation Index. Although significant interaction did not result, there is an interesting loss of two significant interactions which had emerged previously in connection with the WISC vocabulary scale. These are the grade by Deprivation Index interaction (see Table 7) and the grade by SES interaction (see Table 8). The difference appears to be that the analysis reported in Table 11 is a simultaneous study of SES and the Deprivation Index. The analyses in Tables 7 and 8 had studied the Deprivation Index or SES simultaneously with race, but not with each other. Table 11 reveals that once there is some homogeneity in level of disadvantage, as measured by the Deprivation Index, a lowered SES loses its cumulative effect. However, SES retains its cumulative effect on the vocabulary measure despite the control on race, *i.e.*, even within the Negro and white groups. The means corresponding to the main effect of the Deprivation Index are shown in Table 12. The results correspond to those obtained with the Lorge-Thorndike IQ measure—the more the deprivation, the lower the vocabulary score.

Table 11

Results of Three-Way Analysis of Variance on WISC Vocabulary Subtest Scores by Grade, SES, and Deprivation (N = 286)

Source	*df*	*MS*	*f*	*p*
Grade (A)	1	17508.48	304.11	.0001
SES (B)	2	474.56	8.24	<.01
Deprivation (C)	1	356.45	6.19	<.05
A × B	2	165.09	2.87	ns
A × C	1	99.27	1.72	ns
B × C	2	53.59	1.00	ns
A × B × C	2	20.75	1.00	ns
Error	274	57.57		
Total	285			

Table 12

Means for More and Less Deprived Groups on WISC Vocabulary Subtest Scores

Group	*Mean*	*SD*	*N*
More Deprivation	20.94	10.98	172
Less Deprivation	29.53	12.60	114

Table 13 reveals that, in addition to the significant main effects which emerged in earlier analyses, there were significant and independent interaction effects of grade by race and grade by deprivation.

The decline in vocabulary performance in the case of the Negro children is relatively independent of the decline attributable to disadvantage, as reflected by the Deprivation Index. This independence of the Deprivation Index, in the case of the Negro children's decrement on the vocabulary scale, contrasts with what was found in the analysis of the Lorge-Thorndike test. With the latter measure, the grade by race interaction was not significant once deprivation level was controlled (see Table 7). There was no significant Negro decline among homogeneous deprivation groups.

In the case of the vocabulary measure, however, the scores of the Negro children decline significantly despite control over deprivation level. In short, the measure which more heavily reflects language (vocabulary) is more responsive to cumulating deficits among Negroes than is the measure which relies less heavily on linguistic knowledge (Lorge-Thorndike Non-Verbal Test). Table 14 presents the means indicating that among older as compared to younger children there are stronger differences on vocabulary score associated with variation on the Deprivation Index.[4]

Table 13

Results of Three-Way Analysis of Variance on WISC Vocabulary Subtest Scores by Grade, Race, and Deprivation (N = 286)

Source	*df*	*MS*	*f*	*p*
Grade (A)	1	19136.91	318.93	.0001
Race (B)	1	322.23	5.37	.05
Deprivation (C)	1	865.34	14.42	.01
A × B	1	398.83	6.65	.05
A × C	1	283.67	4.73	.05
B × C	1	14.88	1.00	ns
A × B × C	1	168.86	2.81	ns
Error	278	60.00		
Total	285			

Table 14

Means for More and Less Deprived Groups within Grade Levels on WISC Vocabulary Subtest Scores

Group	*Mean*	*SD*	*N*
Grade 1			
More Deprivation	13.54	6.27	89
Less Deprivation	15.30	4.35	36
Grade 5			
More Deprivation	28.88	9.25	83
Less Deprivation	36.09	9.28	78

Conclusions and Implications

The findings will now be discussed in connection with the four problems posed in the introductory section.

First, results indicate that the Deprivation Index tends to act as a factor independent of SES and race in contributing to variation in test performance. Thus, significant main effects on both tests were related to the Deprivation Index even in groups homogeneous with respect to race or socio-economic status. This suggests that cumulations of specific environmental factors such as low parental motivation, or absence of a kindergarten experience, can have a disadvantaging effect despite relatively high socio-economic status, and that the diminution of such features may have an advantageous effect despite relatively low socio-economic status. This latter point provides support for enrichment programs aimed at alleviating the effects of social disadvantage on children of lower socio-economic status. In a similar vein, the cumulative deficit found among Negro children on the Lorge-Thorndike test tends to be ameliorated once level of disadvantage (as assessed by the Deprivation Index) is controlled. Thus, we see that decrements in test performance associated either with Negro or lower-class status tend to be offset or mitigated in the context of cumulations of specific, advantaging environmental factors.

Second, test decrements in the more disadvantaged group (as determined by the Deprivation Index) were more pronounced among the older children. Thus, in the case of the Lorge-Thorndike the older children scoring in the more disadvantaged range of the Deprivation Index tended to score relatively lower than the younger children. This progressive deficit obtained even within groups homogeneous with respect to race or socio-economic status. On the vocabulary scale, as age increases, the disadvantaged children, whether white or Negro, tended to score relatively lower than the more advantaged children.

The findings also indicate that cumulative deficits emerge in connection with each of the three background measures studied. Not only do we find cumulative deficits emerging with respect to the Deprivation Index, but also in connection with Negro status and lower socio-economic standing. However, socio-economic status shows some departure from the two other background variables. Lower SES is the only one of the three variables associated with Lorge-Thorndike deficits among younger childern which are as pronounced as those among older children.

If we compare the role of race and SES with respect to the Lorge-Thorndike, a differentiated picture emerges: the deficit associated with lower SES begins earlier but the deficit associated with race accelerates faster. We have attempted to separate race and SES effects by both the sample design and the statistical analysis. By these methods we have been able to study the effect of race independently of SES. In the general population, however, race and SES are by no means independent, for Negro status and lower SES are definitely associated. This implies that, typically, the Negro child is doubly hit; early deficit may be occasioned by disadvantaging factors associated with lower socio-economic status and later deficit may be produced by environmental factors associated with his being Negro. As the analysis has indicated, some of these later factors are related to the environmental features tapped by the Deprivation Index.

Third, there was little evidence of interaction among the three main types of background variable—SES, race, and Deprivation Index. Thus, with the test measures, performance was not significantly altered within the more complex groupings formed by any particular combination of background factors: low SES, Negro, and in the disadvantaged range on the Deprivation Index. This does not imply, however, that the effect of such multiple groupings is not summative. As we have indicated above in discussing the Negro child who is more often than not of lower socio-economic status, the lowest scores were found among groups defined in terms of combinations of disadvantaging background factors.

It should be noted that unusual decrements, not predictable from simple summations of the three main background factors, were not obtained. The suggestion here is that deprivational factors cumulating over a time may be more important in effecting decrement than the cumulation of conditions within a particular time. This point, coupled with the early deprivational effect of low SES pointed out above, indicates the importance of enrichment programs which are instituted early in the child's life, *i.e.*, before deficit sets in and before it has a chance to cumulate.

Fourth, our findings indicate that the effects of the background factors are a function of the kind of ability under consideration. Thus, race and SES play different roles depending upon the degree to which language is involved in test performance. In the case of the nonverbal form of the Lorge-Thorndike, there was no cumulative deficit manifest when the data were analyzed by SES groups, but the same SES analysis did show a cumulative deficit in connection with the vocabulary scale.

Analysis by race did yield a cumulative deficit finding with respect to the Lorge-Thorndike. This deficit tends to vanish when some controls on level of disadvantage (as assessed by the Deprivation Index) are introduced. However, in the case of the more verbal measure, the vocabulary scale, cumulative deficits associated with race obtain even in the presence of controls on SES and Deprivation Index. The implication here is that the more linguistic measures show greater responsive-

ness to the cumulative effects of certain disadvantaging conditions than the measures tapping non-verbal abilities. The fact that the cumulative vocabulary deficit among the Negro children is independent of both the SES and Deprivation Index points to the importance of a close investigation of the Negro child's environment to uncover those conditions which affect his linguistic development. Such factors may include adult stimulation of the child's speech, adult reward for linguistic modes of expression, the opportunity to hear new words in meaningful context, and the opportunity to discover the utility of a developing vocabulary as instrumental in satisfying one's needs and influencing the social environment.

This paper has attempted to present a differentiated picture of the environmental, temporal, and measurement conditions leading to impaired performance on psychological tests. This picture stresses the importance of specific environmental features in addition to the more global factors of race and SES; it stresses the importance of time as interacting with environmental background in producing a cumulative deficit; finally, it stresses the differential patterning of deficit produced by the nature of the psychological function being measured. These results again point to the need for comparative longitudinal studies of linguistic and cognitive growth for groups differing in social and cultural backgrounds.

Notes

[1]Institute Index of Socio-economic Status, mimeographed, 1964. Institute for Developmental Studies, New York Medical College, New York, New York.

[2]U. S. Bureau of the Census, U. S. Census of Housing, 1960, 3, City Blocks, Series H. C., Nos. 274-276.

[3]For a complete discussion of this procedure see Winer, p. 80.

[4]A possible confounding factor is the increased heterogeneity of variance of the vocabulary measure for the fifth-graders as compared to the first-graders. Such heterogeneity might contribute to the increased association between background factors and vocabulary among the older children, without the necessity of invoking cumulative deficit as an explanatory factor. In order to control for this differential heterogeneity of variance, the fifth-grade correlations of SES, Deprivation Index, and race with vocabulary were each calculated. These Pearson product-moment coefficients were then adjusted through statistical reduction of the vocabulary variance of the fifth grade to that of the first grade, using the formula presented by Gulliksen for predicting correlations when there are changes in the variance of a variable (Gulliksen, 1950; p. 133). Despite these adjustments, there were no changes in the levels of significance for the various correlations between the three background variables and the vocabulary test.

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RACIAL ATTITUDES AS A FACTOR IN TEACHER EDUCATION FOR THE DEPRIVED CHILD

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This paper is based upon three separate studies relating to the area of racial attitudes and perceptions.

Several assumptions underlie the paper. The first is that the Caucasian population of the United States harbors a substantial amount of racial prejudice directed against Negroes. It is possible to cite numerous studies to support this contention, but such proof seems superfluous in the light of empirical observation, anecdotal records, and common sense. The second assumption is that the teaching staffs of our urban areas, drawn chiefly from the middle-class Caucasian reservoir, share in some measure the negative racial attitudes of the communities from which they spring. The third assumption is that these negative attitudes impede the participation of middle-class, Caucasian teachers in programs for the deprived child, who is

usually either Negro or Puerto Rican. It is submitted that the last two propositions follow logically from the first.

The substance of the foregoing is not a blanket condemnation of the white population nor of Caucasian teachers. It is a recognition of the phenomenon which most observers of the educational scene have noted: Caucasian teachers tend to avoid service in the schools which serve deprived children. (So pronounced is this phenomenon in New York City that at one time its Board of Education sought to make promotion in the educational hierarchy contingent in part on service in "tough" schools.) Moreover, it seems reasonable to assume that among the teachers who are assigned to these special service schools, varying degrees of fear and resentment hamper their function. Some evidence of this last point is available from the first of the three studies to be examined.

The purpose of the studies here examined was to analyze in some depth the reluctance of Caucasians to work in special service schools, and to evaluate some remedial procedures.

The first study is a comparison of two groups of student teachers at Hunter College of the City University of New York. The first group was made up of students who had volunteered to participate in the "120" project, a program which places student teachers in "tough" schools, under conditions of intense preparation and extraordinary aid. The second group was composed of student teachers who had rejected the project and had chosen, instead, to work in more normal schools: ones presumably populated by middle-class Caucasian clientele. It was hypothesized that the volunteers would evince less authoritarianism, rigidity, and fears than would their reluctant comrades, as well as more confidence in their ability to handle themselves in difficult situations.

To examine these hypotheses, the following tests were administered to both groups:

1. the Christie 20-item version of the F-scale;
2. the Gough-Sanford Rigidity Scale;
3. a randomly selected thirty-item scale drawn from the final form-E version of the Rokeach Dogmatism Scale;
4. a self-rating scale pertaining to personal history and selected trait characteristics;
5. a projective scale designed to gauge the perception of student teachers with respect to the difficulties of teaching in special service schools;
6. a scale designed to measure the relative importance of factors which induce student teachers to volunteer for special problem school assignments.

For the volunteer group N = 10; for the non-volunteers, N = 26.

Comparison of mean scores between the groups in the case of the standardized questionnaires and comparison of the trends in the case of the non-standardized instruments clearly supported the hypotheses listed. Non-volunteers scored significantly higher ($p. < .05$, one tailed t-test) than did volunteers on the F-Scale, the Dogmatism Scale, and the Rigidity Scale. In regard to personal history and trait characteristics, the pattern of volunteer response indicated a background characterized by a striving for autonomy, by the early acceptance of childhood challenges, and by a relative freedom from the symptomatic signs of diffidence and fearfulness. By contrast, the non-volunteers reported greater childhood uncertainties, especially in the character of their inter-personal relationships. That these early difficulties of the non-volunteers might not have been entirely resolved was suggested by the tendency of non-volunteers to characterize their contemporary relationships as lacking in spontaneity and possessing a degree of contrivance. For example, the statement, "I have to admit to myself that often my interest in people is forced," was one of the most discriminating of items.

Among the questionnaire's other related findings were that the volunteers had greater need to meet challenges successfully, and that they displayed greater sympathy for the disadvantaged than did the non-volunteer. Differences between the two groups again emerged in regard to the perception of the special service school. Non-volunteers saw the special service school as fraught with danger; they confronted a school image which was ominous, threatening, and which involved some anticipation of rejection, resentment, antagonism, and disrespect. On the other hand, volunteers were consistently more benign in their views of the special service school, and were less disposed to attribute sharply negative behavior to the pupils of such schools. An example of this perceptual disparity is found in the different estimates of the two groups when asked to indicate what per cent of pupils of a special service school would respond, in disciplinary situations, with insults and threats to teachers. The non-volunteers presented a mean estimate of thirty per cent; the mean estimate for the volunteers was ten per cent.

The final instrument—the preferential rating of ameliorative procedures for special service schools—once more revealed the gulf between the two groups. Volunteers tended to subordinate those proposals related to the easing of teaching conditions to the proposal that teachers be given a greater choice in the making of educational policy. The non-volunteers, however, indicated that their greatest needs were those of reducing the magnitude of classroom problems by such measures as reduction of class size and greater teacher assistance.

Inasmuch as it can be presumed that teaching in a special service school calls for flexibility, for freedom from prejudicial and authoritarian process, for sympathetic perception of the disadvantaged, and for readiness to act in self-reliant and confident terms, the selective process appears to urge just such students as are measurably higher in these characteristics to volunteer for special service schools. Thus, the evidence reviewed seems to support the idea that self-selection is the best means of fitting the student teacher to the demands of a particular school situation.

Whatever its virtue, however, self-selection's utility is limited by the number of volunteers it can produce, and there is no evidence that these volunteers have been forthcoming in numbers sufficient to meet the pressing needs of the problem schools. Consequently it appears that efforts must be made to attract larger numbers of people to special service schools. In this connection, it would be well to note the fear disclosed by the non-volunteers of the study, and to concede that at least part of these fears represent a core of realistic self-doubt that is not to be overcome by any objective portrayal of the special service school situation. Although there is little reason to believe that the non-volunteers that scored at the extremes of authoritarianism, rigidity, and dogmatism could be reached by any program short of earth-shattering proportions, it does seem likely that the non-volunteers who came close to the volunteer mean scores could become amenable to special school service. Their potential might be realized if they were to be provided with an effective interpersonal technology, including a repertoire of responses to categories of disciplinary and disruptive situations. No less than other professionals, the aspiring teacher must believe that his equipment includes concrete operations for meeting specific demands and emergencies.

The next two studies seek to evaluate varying conditions of contact with Negroes as a means of reducing racial fears and antagonisms as well as establishing a more receptive psychological set for teaching deprived Negro children.

The first study applied the equal contact aspect of inter-ethnic perception theory to the issue of amelioration of race relations. Specifically, the experiment was designed to determine whether middle class, Caucasian college students would be more amenable to persuasion by a Negro college instructor than to persuasion by a Caucasian college instructor. The underlying hypothesis was that the Negro instructor, representing a race-class combination not usually encountered by the students, would be more effective than his Caucasian colleague.

The subjects were two sections of Hunter College students in the introductory course of the education sequence. All information regarding their background and method of placement firmly supported the belief that they were drawn from the same population. The instructor [the author] was the same for both sections.

Each of the two sections listened to an appeal to volunteers for a special education sequence which would prepare them for service in a "tough" school, one presumably populated with Negroes and Puerto Ricans. The first section heard the appeal made by the Negro professor; the second section heard the Caucasian instructor. In both appeals, the professors represented themselves as middle-class persons by utilizing the phrase, "we middle-class people . . ." at the beginning of any one sentence which could logically support such an opening phrase. At the end of the appeal, which lasted about twenty minutes, students were asked to respond by means of a five-point scale to three questions relating to their evaluation of the idea and their willingness to participate in the special program. The scores made by the two sections constituted the experimental criteria.

To control extraneous factors, particularly speaker personality, the two professors' speeches, although individual to an extent, stemmed from identical outlines composed by the author. The role of individual personality was examined by asking the students, after responding to the criteria questions, to rate the communicator on nine dimensions relating to personality and communication.

For all three experimental criteria, the auditors of the Negro professor made scores significantly higher than those of the auditors of the Caucasion professor. Comparison of the personality-communication ratings revealed that the Caucasian professor received higher ratings than his Negro confrere on seven of the nine traits assessed, with three of these differences statistically significant. One of the two differences in favor of the Negro professor was statistically significant.

Inasmuch as the Caucasian professor received a higher ranking than the Negro professor in the direct evaluation of personality and communication, while the Negro professor had more success than his Caucasian colleague in eliciting willingness to participate in the experimental program, it seems reasonable to infer that the combination of Negro race and middle socio-economic class is a compelling one as a factor in persuasibility. The implications for education in the broadest sense are numerous; one of the most obvious is that exposure of Caucasian students to Negro middle-class figures would have highly salutary effects.

The purpose of the last study was to compare the relative powers of the two factors of similar personal interests and similar socio-economic status as means of improvement of perceptions of Negroes in the minds of Caucasians. The rationale of the study, as of the previous one, stemmed from the findings of numerous experiments which appear to indicate that the

factor of equal status contact is the most potent one in elevating the status of Negroes in Caucasian eyes. These findings, however, leave open the question of the type of equal status contact: i.e., equal status in employment, in political beliefs, in religion, in overall philosophy, and the like. Moreover, they say nothing regarding the comparative "pulling power," as it were, of each of these elements.

Accordingly, the study was designed to ascertain which realm—the realm of similar personal interests or the realm of socio-economic position—was more effective in inducing middle-class, Caucasian college students to view Negroes more favorably, at least to the extent of selecting Negroes as partners in a limited, non-contact work situation (the definition of this experiment).

One hundred nineteen students from two colleges in a suburban area of a Northeastern metropolis participated in the experiment, which was executed in two phases. During the first phase, an associate of the experimenter, masking his true purpose, administered what he identified to the subjects as the "Whitman-Rogers" Attitude Inventory Survey, but which was, in fact, a modified version of the California F-Scale included within a larger questionnaire. Other parts of the survey comprised various items culled from a number of personality evaluation questionnaires. On the basis of performance on the F-scale,* subjects were divided into three groups: those who had compiled scores in the highest third of the range of scores; those who had compiled scores in the middle range; and those scoring in the lowest third of the range. Thereafter, the subjects were referred to as high, middle, and low F-scale scores. The "Whitman-Rogers" subject also served to prepare the personal interests variable, as the score of each subject was noted for the purpose of eventually informing her that one of her two possible choices had made a score very similar to hers and the other had compiled a score quite different from hers.

After the administration of the "Whitman-Rogers," the investigator, with five assistants, appeared before the subjects and represented himself as an experimenter in the field of extrasensory perception. He had approached them, he said, because he had accidentally learned of their experiences with the "Whitman-Rogers" Attitude Inventory Test, ostensibly a vital ingredient in preparation for extrasensory perception exercises. He oriented the subjects to the area of extrasensory perception and told them that he was introducing an innovation in the experiment in which they were to take part; namely, the choice of a working partner, which was to be the first step in the attempt to communicate extrasensorially. Each subject was interviewed privately by an assistant who proffered a suggestion regarding the criteria the subject might employ in reaching a decision, but reassured her that the choice was hers. He then presented to her information about her two possible choices, Miss A and Miss B. Half the subjects were informed that ESP worked best when one chose as a partner someone very similar to oneself; the other half heard that ESP worked best when one chose a person quite different from oneself.

Miss A and Miss B were described in terms relating to the scores they had allegedly made on the "Whitman-Rogers" and to their socio-economic status; they were either similar to or different from the experimental persons in each dimension, depending upon the category to which the person had been assigned by the research design. The two proffered girls occupied the dichotomous halves of each variable; i.e., if one were different from the experimental person in a socio-economic manner, the other would be similar to the experimental person, with the same situation holding true for the personal interests factor. One of the choices presented to the experimental person was a Negro and the other a Caucasian, a condition of which the person was made aware by an action which, by design, was made to appear as an afterthought. There was a casual flipping of the folders containing the information and the pictures of the two girls, accompanied by the seemingly offhand comment by the assistant to the effect that the subject might wish to have a glimpse of the girls of whom she had just heard.

As controls, the same two pictures were used to show to all one hundred nineteen subjects. The language used to describe a variable and the component elements thereof, were likewise uniform for all subjects.

Given three dichotomous variables, and three categories for the subjects, a three-times-two-times-two-times-two design emerged (three categories of subjects in terms of their F-scale, two "equal status" factors, two races, and two suggestions). This necessitated a total of 24 cells to accommodate every possible combination of variable direction and subject category. The design was so balanced as to permit each variable to operate equally to the benefit of the Negro and Caucasian targets, and thus establish confidence that any imbalance in ultimate choices made was due to the superior functioning of one or the other variables.

After the subjects made their selections, they filled out brief questionnaires which sought to ascertain the reasons for their choices, and were then led back to a central marshalling point where the investigator led them through an alleged ESP experiment. Ultimately, the subjects were apprised of the true nature of the experiment and given the reasons for the deception.

*The F-scale has proved to be an excellent disguised measure of anti-Negro feeling.

The evidence offered powerful support to the conclusion that the controls had been successful and that all results had been accounted for by the experimental variables. The first findings, derived from the chi-square analyses of the data from the total population and from pertinent subsections, revealed that (a) the personal interests variable had been more effective than the socio-economic status variable in eliciting choices of Negroes as partners and was strongest in the ranks of the low F-scale scorers; that (b) the personal interests variable was more effective than the socio-economic status variable in drawing choices of partners, regardless of race, and that it itself was not a factor for the population as a whole in making selections. A more refined data analysis, derived from other cell combinations and further subdivisions of cells, disclosed that the superiority of the personal interests variable over the socio-economic status variable regarding the selection of Negroes was statistically significant only for the low level of F-Scale scorers; that the personal interest variable's superiority regarding the elicitation of choices, regardless of race, was insignificant when each level of F group was treated independently; and that race was a factor in the psychodynamics of choice of the high and the low F-Scale groups, acting as a deterrent to the selecting of Negroes among the high F-Scale scorers and having precisely the opposite effect for the low F-Scale scoring group.

It is not suggested here that the three studies cited, which were little larger than pilot projects, have conclusively demonstrated the "correct" paths toward diminution of unhealthy racial attitudes and consequent recruitment of teachers for deprived children. It is suggested, however, that they do call for—first, greater efforts to discover those methods which would be most effective in reducing the realistic fears of young teachers, together with the realization that such effort requires the elimination of blame and recrimination; second, large scale projects involving the close association of Negro professional personnel with Caucasian, middle-class youngsters, and/or evaluation of situations where such a condition exists, with such evaluation by behavioral criteria. It is also suggested that the assumption that negative racial attitudes impair teaching be subjected to systematic evaluation of the impact on deprived children of teachers of varying personality dimension.

EFFECTS OF ENVIRONMENTAL DEPRIVATION ON BASIC PSYCHOLOGICAL PROCESSES: SOME HYPOTHESES

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All organisms learn about the world around them through their sensory and perceptual processes, and the development of these processes plays a crucial role in the more general psychological and cognitive development of children. Theories such as Werner's and Piaget's, especially, propose perceptual processes and their development as the foundation for later abstract and cognitive skills. Although arising from another area, educational practices such as those developed by Maria Montessori also proceed from the assumption that cognitive structures are built on the foundation of sensory experience.

Other theorists have placed more emphasis on language and language development as crucial to the problem-solving process. Piaget does not negate language as a highly important element in the maturation of problem-solving process and other cognitive functions, but he does say that the development of intelligence proceeds on the basis of sensory and sensory-motor and perceptual experience. Montessori, on the other hand, had very little place for language in her basic program, although some of the newer Montessori schools, particularly those in California, are placing somewhat more emphasis on language. The theorists who particularly emphasize language functions in problem-solving include Whorf, the Russian school which is represented by Vigotsky and Luria; they find support in the work of Bernstein, the English sociologist. These investigators all regard verbal mediational processes as central to the higher conceptual processes. Current work by the Kendlers, for instance, on concept formation using visual stimuli is interpreted by them as evidence of the onset of verbal mediational processes between the ages of five and eight.

While the sensory-perceptual and the language theorists differ in what each regards as primary, there is no implication that all the processes referred to are not related to each other in various ways. This point should be especially emphasized, as from time to time there is danger of seeing the two aspects as polar opposites, instead of probably complementary ways of regarding the same developmental phenomena.

Part of the basis for what can be considered an incorrect polarization of these positions is the assumption, usually tacitly held, that the development of language is socially determined, but that perceptual development is not. However, the fact that experience

is important in perceptual development has been documented in various studies on sensory isolation, both when experimentally induced and when produced as an accident of nature. Von Senden, for instance, reported on a number of studies of persons who had been blind from birth and who were studied shortly after newly devised operative techniques gave them sight for the first time. It was found that some patients never did develop pattern vision, even with training. Some of these people who, while blind, had learned the different properties of squares and triangles, were able to recognize these forms after gaining vision only by counting the corners and using other kinds of verbally mediated processes. The experiments on chimps who were raised in the dark, reported by Riesen, showed that the animals' visual perception was permanently impaired after too long a period without light.

These studies are well known and have established the fact that there is a relationship between the absence of stimulation and the lack of development of functions. All of these studies, however, have been investigations of the effects of a total absence of particular stimulation; unfortunately none of them has dealt with the relationships between particular amounts of stimulation and the development of functions, nor with the relationship between the quality of stimulation and functional development. Further, they have all dealt with vision as the modality affected. Generalization from the results of the studies, though, could yield hypotheses about the effects of stimulation on perceptual development in all sense modalities, and about the effects of varying amounts of stimulation on the development of function. These hypotheses could then be tested in appropriately devised experiments.

Ethical and human considerations prohibit the manipulation of the quality of stimulation available to infants from birth until school age, but a metropolitan area gives an investigator considerable natural variability to study in the form of children who come from different conditions of life. Similarly, study of institutional populations yields data on these factors without experimental environmental manipulation. From this latter source, there are studies by Dennis (1957) and by Fantz (1965) which tend to indicate that some stimulus deprivation will result in some functional deficit.

Elsewhere I have advanced some hypotheses as to the possible effects on auditory perception of growing up in the slums (C. Deutsch, 1964). Briefly, the reasoning was that a child's level of auditory discrimination skill may be related to the stimuli which assail him, and particularly to the relation of meaningful stimuli to noise in the environment—that is, the signal-to-noise ratio. There is considerable current animal research on the reticular activating system which would indicate that stimulation of this system can inhibit the actual transmission of nerve impulses in particular modalities. Without generalizing from animals to humans, it might nevertheless be hypothesized that a noisier environment—again, one in which there is a low signal-to-noise ratio—might more easily inhibit the transmission of specific auditory signals and thus result in fewer meaningful stimuli being perceived by the child in such an environment.

Before continuing with further discussion of the potential relationship between the quality of the stimulus environment and the development of functions having to do with the apprehension of stimuli, let us return to the consideration of the roles of the perceptual and language processes in cognitive development.

There is considerable evidence from Templin (1957) and Bernstein (1960) and from work we are engaged in at the Institute for Developmental Studies (M. Deutsch, 1965), that the social milieu has a profound effect on linguistic structure and use. In turn, language development is highly influential in scholastic performance, particularly in reading and its development. Children from disadvantaged backgrounds come to school with a somewhat different verbal equipment than their middle-class counterparts, and these lower-class children contribute disproportionately to the reading-retarded group. But we have found that retarded readers are deficient in auditory discrimination, as compared with normal readers. What has been defined here is a complex set of relationships among social background, language ability, reading and auditory discrimination. With the well-established relationship between hearing and speech development, the only aspect of these interactions not yet demonstrated (except circumstantially) is that between social background and auditory discrimination.

The importance of a link between social conditions and perceptual functioning can hardly be estimated, and we shall shortly be mounting a project to investigate whether a relationship between social class background and auditory discrimination obtains. The studies of Pasemanick and his associates (to name just one body of work) has already demonstrated a real interpenetration between the conditions of life and the individual's biological functioning—even his biological endowment, through the nutritional and other health habits of the pregnant woman. Further evidence of interpenetration between the social and the neural in perceptual functioning would make even stronger the case for the influence of the educational process in human development and, indeed, in the development of our whole society.

What is being emphasized in this discussion of the influence of social factors on learning processes is not the motivational and group dynamics factors, which have been the traditional content under such headings, but rather social influences on some of the processes which we tend to consider basic to late learning and

to the acquisition of other skills. Two categories which have been discussed are perceptual and language processes. A third which should be mentioned is attentional processes.

Zeaman and House and their associates (1961) have been demonstrating the importance of the nature of stimulus presentation in engineering the attention of the subject, as well as in ascertaining that the subject is really attending to what the experimenter thinks he is presenting. Zeaman and House indicate that, in their view, attentional factors may indeed be primary. Although the subject groups which they are studying are retardates, with their technique involving discrimination learning by the subjects, the hypotheses which they advance from their results are generalizable to other learning situations and other subjects. For instance, when children are presented with particular stimuli, they do not always respond to the aspects which the experimenter—or the teacher—regards as primary.

Attentional processes have central aspects as well as external field aspects. Attention can be engineered through the organization of the stimulus field, but it is a central process as well, as is indicated in the work on vigilance and on the reticular formation referred to earlier.

Attention, then, is another process which has both external and internal aspects. In perception, language, and attention we have three processes which are basic to learning, and which, though central psychological functions, are influenced by characteristics of the external environment.

Once this is established the next steps become clear: one must define which aspects of these processes are most influenced by which aspects of the external environment. The work on sensory isolation yields some information on these points. In the typical sensory isolation experiment, the subject was isolated as much as possible from all classes of stimuli: visual, auditory, tactile, access to temporal cues and the like, as well as from other human beings. From this generalized isolation came generalized responses in the subjects who remained the full experimental time in the isolated situation: anxiety, later followed by apathy.

However, a more recent study by Suedfeld, Grissom, and Vernon (1964) made an attempt to relate different aspects of the isolation to different responses to it. The experimenters had three groups: one which was sensorially deprived and isolated from social interaction; one group which was isolated from social interaction but not sensorially deprived; and a control group. A Thematic Apperception-like test was administered before and after the experimental treatment. The findings were that the group that had been subjected to both sensory and social isolation gave very minimal stories on the test after the experimental treatment, and had a significantly slower rate of speech than did the group which had been only socially isolated. This second experimental group—the one that had been subjected to social isolation but not sensory deprivation—produced more and longer stories, and more speech than did the other experimental group or the control group.

This experiment, then, indicates that different aspects of isolation produce different kinds of behavior in the subjects, that when social isolation occurs alone, it makes for a very different kind of effect from when it occurs in combination with sensory deprivation. What effects on behavior would occur from the use of other types of combinations of these variables—social isolation with sensory over-loading, and the like—remain questions for future investigation. In the context of this paper, the point is that the social circumstances in which people are placed have profound effects on their later reactions, their reactivity, and their response potential to various stimuli.

This would have important implications for classroom organization—for dealing with the social organization of a classroom which includes new programmed instruction which in turn, creates a situation where a child is going to be by himself for a period of tine. There are implications here for dealing with children who come from crowded slums: What are the effects of the overabundance of both people and some kinds of sensory stimulation (mostly very noisy and not meaningful to the child) in the immediate environment? How do these effects influence the child's response to the learning situation? How might they influence his basic learning "equipment"?

In the light of the foregoing discussion, let us return to a consideration of perceptual processes, and the relation between environmental forces and the development of perceptual skills. For many years it has been known that the organization of the stimulus field is a highly important factor in the perception of the stimulus which is being presented. Many Gestalt experiments attest to the ease of producing the visual sensation of closed circles in a subject, when the actual stimuli are open circles. Visual illusions can be manipulated; perceptual constancies can be preserved, or destroyed. And all these effects can be achieved by manipulating the organization of the stimulus field or its exposure time. For the experimenters who first explored this area, this meant pencil and paper stimuli and the manipulation of geometric forms. But it would seem quite reasonable to believe that the organization of the natural stimulus field is similarly influential in determining what is perceived, and that this understanding does not have to be confined to the visual field alone.

Similarly, we need not consider only one stimulus field: there is the stimulus environment of the home, of the school, of the neighborhood, to name but a few. In learning more about the relations which obtain le-

tween stimulus field and perception, and between perception and learning, we should also be better able to create, in the environment(s) over which we have most control, that stimulus field which best fosters the growth of perceptual skills and learning.

Let me present an example of a stimulus field over which we have control, yet one in which the basic stimulus organization laws are typically violated: the reading primer. One of the purposes of the format, typography, and organization of a primer is to draw the child's attention to it in order to increase his motivation to learn to read—and to increase his exposure to the relevant stimuli. But how is this attention engineered? By the use of color and of pictures. Each page contains a large colored picture, and a smaller collection of black-and-white letters which form words. What aspect of the stimulus has the "pull" for the child? Obviously, the colored picture. Yet it is desired that the child pay attention to the black-and-white letters in order to learn to read.

It seems clear that, perceptually, the organization is incorrect. However, it is not clear that the reverse would be preferable; it is simply that some thought and investigation about the properties of the stimulus field and their effects on learning is in order here. While the "New English" and its accompanying reading materials was apparently not consciously influenced by these perceptual considerations, its primer organization is much better in visual-attentional terms. The primer is only one example; a stimulus analysis of the classroom would no doubt yield additional pertinent data about the relationship of the stimulus field to the efficiency of the learning process.

This brings us to the question of changes in the stimulus field. Mentioned earlier was the finding that poor readers have poorer auditory discrimination than do good readers, and that the incidence of reading disability among disadvantaged children is higher than it is among middle-class children. Preliminary findings on the influence of social class background on perception indicate that at the first grade level, there is an auditory discrimination difference between lower- and middle-class children. This difference no longer obtains, however, between groups of fifth grade children. While this is not direct evidence, it is consistent with the hypothesis that an early noisy background impedes the proper development of auditory discrimination skills. These skills mature as the child grows older, as he has more contact with the relatively quieter atmosphere of the classroom.

The other major class of variables which I have been discussing requires less argument to show how strongly they are influenced by environment. These are language, language development, and therefore the use of language as a mediational process in problem-solving. Language *per se* is obviously socially determined: people speak the language to which they are exposed. At the same time, the capacity to acquire language is internal. Hence we have a very clear illustration of the interpenetration of the external and the internal in the influence and determination of a skill basic to learning.

Bernstein (1962) has made a special point of the social determination of language and language usage, emphasizing the social class basis of the language which is developed. He talks about a restricted speech, typical of the lower class person, which includes simpler syntax, fewer prepositions and modifiers, fewer complex and compound sentences; and an elaborated speech, which includes a greater number of all the more complex syntactical forms. From these observations he makes a very good argument for the existence of great communication problems across class lines. While this may be more true in England, where Bernstein works, there is no American data to contradict it. As schools in some areas are paired for purposes of better integration, as we more freely cut across social class lines in our organization of children's groups, we may run into more cross-class communication problems among peer groups than we have before.

Some of the communication problems between middle-class teachers and lower-class children may stem from linguistic variables such as those defined by Bernstein. Early language training, and early cross-class experience may come to be important factors in positively influencing later scholastic performance.

In any event, the more links found between verbal mediational processes and problem-solving, the more important the social class and environment determinations of language become. If Bernstein's hypotheses are substantiated, and social class environments are influential in determining the kind of language used; if verbal mediational processes are indeed exceedingly important in problem-solving abilities, then the conclusion is inescapable that environmental background factors can be very important in the training of problem-solving abilities. These underlying skills are what are probably most crucial in the learning process, both in school and out of school. As we define links between environmental conditions and perceptual and linguistic processes, we should arrive at an even more critical understanding of the relationship of social process or environmental factors to basic learning and learning skills in children.

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INDIANS IN TWO PUBLIC SCHOOL SYSTEMS: DEPRIVATION AND DISADVANTAGE

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The Indian American who is living on a reservation partially as a ward of the Federal Government presents, in many cases, a classic picture of segregated life which is highly deprived and which is legally sanctioned by our society. Adults and children leave the reservation for specific purposes: shopping for goods, travel in the immediate area, work, and, for children, schooling.

In both of the communities where beginning studies are being conducted, Indian children attend school with non-Indian children on a fully integrated basis. The schools are off the reservations, except in one case where the tribe deeded part of its land for a school built by the community. Typically, the child from the reservation is bussed to the neighboring community and then is bussed back after school. The situation is not unlike that of several large cities where some children are bussed from one neighborhood to another.

The general economic, social, and physical conditions on these reservations are pathetic. The traditions of fishing and minor agricultural pursuits are not sufficient to maintain any adequate standard of living. The homes of the Indians are generally in very poor repair with inadequate facilities for sanitation, heating, and water. A state of general depression exists and has existed for a number of years. The etiology of this state of deprivation and disadvantage will be examined later in the paper.

The health and welfare of the Indian American in the Pacific Northwest and especially in the two communities under study is extraordinarily depressed. Approximately 30 per cent of the Indian families are on public welfare; this is six times the rate of the local community. However, the overriding statistic which blots out all others is the average life span of the Indian. In 1960 the median life span of all Indians was not more than 41 years and in the Pacific Northwest it was not more than 46 years. In essence, this means that the Indian child looks forward to approximately 25 fewer years of life than his non-Indian counterpart.

Other statistics follow a dreary trail after this first shocking realization. Indians are hospitalized twice as frequently as non-Indians; tuberculosis occurs at four times the rate of the whites; infant mortality is triple the non-Indian rate. One is not reassured by the accurate observation that in the area of health and welfare, conditions have improved in the past ten, twenty, or thirty years. All in all, one can say that the cycle of poverty, disease, and depression has struck these people with a vengeance.

The schooling of Indian children plays a critical role in their eventual social and economic disintegration. In no manner am I saying that the schools are deliberately creating the conditions of failure and desperation; however, it is in the lack of any clear responsibility for breaking the cycle of poverty that the schools and other public agencies are partially to blame. If one has a lock-step grade system it is easy to condone failure if children do not meet the "standards"; if one views children as agents of an alien culture, it is easy to blame the home conditions for lack of response.

The statistics related to school dropouts, to attendance rates, to percentile ranking on achievement and aptitude tests are telling points when looked at in relation to the generally impoverished state of the Indian families. It is also important to note that the 1963 statistics presented in this paper have not substantially changed from previous years and that the number of Indian children involved has remained essentially constant.

In community A the Indian children constituted 39 per cent of all children enrolled in the first grade (Indian N = 18). This figure drops to 3 per cent in the ninth grade and there are no Indian children enrolled in grades 10, 11 or 12. By the end of the fourth grade, 65 percent of the Indian children, but only 5 per cent of the non-Indian children, have failed at least one grade.

In community B the Indian children constituted 33 per cent of all children enrolled in the first grade

(Indian N = 34). This figure drops to a low of 3 per cent in the twelfth grade. By the end of the fourth grade, 46 per cent of the Indian children, but only 5 per cent of the non-Indian children, have failed at least one grade.

In both communities the decline in enrollment of Indian children is steady and constant, with sharp drops in enrollment at the seventh and ninth grade levels. In several other communities preliminary data indicate the same kind of steady drop with few remaining to the end of the twelfth grade. It should be noted that the issue of Indian children's constituting the majority or minority has little to do with the dropout problem. In one community where Indian children are in the majority, 95 per cent of the first grade children are Indian, but this figure declines to 11 per cent of the twelfth grade.

The number of days absent per year ranges for Indian children in community A and B from double the rate to four times the rate of the non-Indian. There is little question that teachers view the low achievement and failure rates as directly related to the disproportionately high absence rates.

Reading tests for both communities indicate that Indian children begin the first grade less able for the reading program than non-Indian children. Reading tests given to Indian children during the first grade indicate a range in percentile scores from 78 to 5 with a median at 21. Non-Indian children have a percentile range from 97 to 45 with a median at 80.

In 1960-1961 Roger Karrigan, a teacher from a Washington public school district, collected data which substantiate and enlarge upon the data which we are gathering at this time. He found the following:

1. There was a disparity of 24 points in the median IQ scores of the Indian and non-Indian children (84:108).
2. In 1960 over 50 per cent of the Indian children were retained in the first grade of community A.
3. The average daily attendance was 20 days less per year for Indian children than for non-Indian children.
4. On tests administered to the ninth grade (verbal reasoning, numerical ability, abstract reasoning, spatial relations, clerical speed, mechanical reasoning, and language usage), percentiles indicate that Indian children did not score higher than non-Indian children on any test and on only one test, spatial relations, did Indian girls score the same in percentile rank as non-Indian girls.
5. On none of the scores did Indian boys score higher than Indian girls.
6. The scores of Indian boys in verbal reasoning, abstract reasoning, mechanical reasoning, and sentence usage fell below the fifteenth percentile. Mechanical reasoning fell at the first percentile.
7. In the first three grades of school 60 per cent of the Indian children failed one grade or more.
8. As the Indian child proceeded through school he fell farther behind. The mean grade equivalent difference between Indian and non-Indian children at the fifth grade was .1 grade. By the ninth grade this difference had increased to 2.7 grade.*

One of the areas in which we are gathering data is the pre-school and early school social and readiness factors related to later school failure. During the summer of 1964 a private agency conducted an integrated pre-school class in the school of community A. During this time we were allowed to observe, record notes and data, and do extensive interviews with children and the teacher. This material is most valuable when one views the normative data of later school failure together with depressed aptitude and intelligence scores. The teacher of the class is a regular nursery school teacher in the city of Seattle; she was able to compare her usual classes during the year with the children in this nursery school. Indian children predominated; there were four non-Indians in the class. [Indian N = 18; total N = 22].

The following are summaries of her observation records as well as observations we made on the scene.

1. The Indian children were deficient in listening skills, could not handle group discussion, and were deficient in language facility when compared to non-Indian children.
2. Of the 18 Indian children, 17 had no experience with painting, play dough, finger painting, or in the handling of these materials. The nursery school time was spent learning the rudiments of these materials. Moreover, the children were unfamiliar with crayons.
3. Approximately three-fourths of the Indian children did not utilize any of the books which were available, either before or after being read to by the teacher.
4. The concept of a daily task was foreign to the children. The notion of each child sharing in the passing of daily cookies and juice was not understood. By the end of the summer, one-third of the children did pass the cookies and juice when asked; one-third volunteered to pass, and one-third did nothing.
5. Concepts of a group leader, lining up for outdoor play, and orderly procedures for exit and entrance were foreign to the Indian children.
6. Eating habits of the Indian children were sporadic; set times for food seemed to be unknown to them.
7. Many of the Indian children were closely related by marriage and blood, and thus the teacher was viewed as the outsider.

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*Unpublished M.Ed. thesis, Roger Karrigan. University of Washington, 1961.

8. The Indian children had a strong sense of independence. They could dress, toilet, wash, and care for themselves. Playground activity and disputes were settled by the children, usually without the teacher's intervention.

9. The children gave evidence of strong withdrawal when extensive speech patterns were used by the teacher. The children used very simple phrases when they spoke at all.

10. The idea of "clean-up time" was foreign; the children did not pick up toys, boxes, blocks, etc. This caused the teacher some concern.

11. Transfer was evidently "nil"; activities taught and apparently mastered were not engaged in by the children on the following day. The teacher engaged in much repetition and explication of identical activities.

12. The teacher's judgment (and ours) was that the children would experience great difficulty in their beginning program.

13. The Indian children did not have a "questioning syndrome."

14. There was a great deal of solitary play on the part of the Indian children.

15. The teacher's judgment (and ours) on the ages of the Indian children was off by at least one year, because of their smaller physique and size.

16. The children gave evidence of placing a great value on certain concrete physical possessions. For example, they would not remove shoes for rhythms.

17. The Indian children had little group empathy for non-Indian children.

18. There was little volunteerism in play or activities on the part of the Indian children.

19. Many items in the room were completely foreign to the Indian children.

20. Some social habits (dunking cookies, for instance) immediately set the Indian children apart from the non-Indian children.

21. Group singing was foreign to the Indian children.

22. There was little of an initiating, organizing, or competitive attitude on the part of the Indian children.

It is difficult to summarize the differences that existed between the Indian and non-Indian children. By and large, one had to note the variance between the objects in the room—an easel, for example, or clay—and the relatively little acquaintance the Indian children had with these things. They had little background in following directions or in the general concept of "a place for everything and everything in its place."

There was little of what teachers are prone to call "cooperation" on the part of the Indian children. On one occasion the teacher said to a child who had been somewhat too strong-willed for her, "You can go and come back when you are ready." The child never came back.

The lack of competitive drive is, on all counts, a strong element in this particular Indian subculture. Teachers learn early that if an Indian child cannot answer a question in class discussion, in many cases no other child will volunteer for fear of embarrassing the first. The entire range of getting, driving, organizing, and initiating activities is largely absent from the life of the Indian child before he comes to school.

The alienation syndrome which is caused by the lack of communication between the Indian culture and neighboring white culture, the failure of an industrial, competitive society to make an impact on the segregated ghetto of Indian life, the residue of discriminatory attitudes on the part of communities and agencies within these communities, the total withdrawal, grade by grade, of most Indian children in school is one that is predictable and reliable. This syndrome is reinforced by the number of Indian males who abandon their families for long periods of time. The effect of ghetto life, of a culture which is different in many but not all respects, of the impact of a socio-economic depression and the lack of a coordinated attack on these problems, has caused much misery, disease, and early death for these unfortunate people.

The choices in this situation are, to me, relatively clear. One can continue to do what has been done and live with the situation as best we can: or a concentrated effort can be made to bring these Indians into the twentieth century. This case study indicates the impossibility of maintaining both an open, free, and competitive society and any form of ghetto life which shuts people away from this larger society.

The costs of this effort will be high. Schools must begin early training of children and mothers; teachers must be retrained. Radical measures must be taken to end the ghetto of the reservation. Equal employment must be enforced. It is almost axiomatic that the lack of effective political power militates against the mounting of this necessary full-scale attack. What is really required in this situation is a desire to do those things which must be done for the sake of human beings who need our help.